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U.S. Serial No. 10/597,840
Amendment Dated December 16, 2008

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application

1. (Currently Amended) An apparatus for filtration comprising:
provided with a micro or ultrafiltration filter chosen from the group consisting of micro and ultrafiltration filters, wherein the filter is provided with having a filter housing (1) having bounding a retentate side (3) and a permeate side (4), wherein the retentate side and the permeate side that are separated from each other by filter material (2),
wherein a fluid supply pipe that (5) is connected to the retentate side (3) and;
a permeate discharge pipe (6) that is connected to the permeate side (4), wherein, in the permeate discharge pipe (6);
a shut-off valve (7) that is provided in the permeate discharge pipe;
a controller adapted to operate the shut-off valve operable at a high frequency is provided and wherein; and
means for increasing the pressure in the permeate side (8-11) are connected to the permeate side (4) for increasing the pressure in the permeate side (4) when the said shut-off valve (7) is closed to a value that which is higher than the pressure on the retentate side, wherein the means for increasing the pressure in the permeate side comprises: (3)
at least one permeate circulation circuit which is, on the one side, connected, by an inlet, to the permeate discharge pipe at a point downstream of the shut-off valve and, on the other side, by an outlet, to the permeate side of the filter housing, wherein a

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permeate circulation pump is provided in the permeate circulation circuit; and
a permeate buffer in the permeate circulation circuit configured to feed the
permeate circulation pump during the closed condition of the shut-off valve.

2. (Currently Amended) The ~~An~~ apparatus according to claim 1, wherein the shut-off valve ~~(7)~~ is configured ~~designed~~ to be opened and closed periodically, wherein the shut-off valve ~~(7)~~ is kept in a closed position so long that a higher pressure is built up on the permeate side ~~(4)~~ than on the retentate side ~~(3)~~, such that a reversal of the fluid flow in the filter material ~~(2)~~ occurs, wherein the means ~~(8-11)~~ for increasing the pressure in the permeate side ~~(4)~~ are is configured ~~designed~~ such that, for the rest, a reversal of flow direction of fluid volumes in pipes of the apparatus is prevented.

3. (Canceled)

4. (Currently Amended) The ~~An~~ apparatus according to claim 13, wherein, upstream of the outlet ~~(10)~~ of the permeate circulation circuit ~~(18)~~ and downstream of the pump ~~(9)~~, a restriction ~~(11)~~ is included in order to prevent a jerky pressure build-up.

5. (Currently Amended) The ~~An~~ apparatus according to claim 13, wherein the ~~in~~ ~~the permeate circulation circuit (8), a permeate buffer comprises a permeate buffer tank (12) is provided for feeding the permeate circulation pump (9) during the closed condition of the shut-off valve (7).~~

6. (Currently Amended) The ~~An~~ apparatus according to claim 1, further comprising:
wherein the fluid supply pipe (5) is connected to a first end (15) of the retentate side (3)
of the filter housing (1), wherein a retentate circulation circuit having an inlet that (14) is

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connected to a second end (16) of the retentate side (3) of the filter housing and comprising:

~~(1), wherein an~~ an outlet that (13) of the retentate circulation circuit (14) is connected to
the fluid supply pipe that is connected to a first end of the retentate side of the filter housing;

~~(5), wherein a retentate circulation pump that (17) is provided in a retentate circulation~~
circuit; and

~~(14), wherein the a first end of the retentate side being (15) is opposite the second end of~~
the retentate side (16); such that, with a switched-on retentate circulation pump (17), a cross-flow
along the filter material (2) occurs.

7. (Currently Amended) The An-apparatus according to claim 6, the permeate side of
the filter housing having a first end and a second end,

~~wherein the outlet (10) of the permeate circulation circuit being is connected to a first end~~
~~(18) of the permeate side (4) of the filter housing (1),~~

~~wherein the permeate discharge pipe being (6) is connected to a second end (19) of the~~
permeate side (4) of the filter housing (1), and

~~wherein the first end being (18) is opposite the second end (19), such that, on the~~
~~permeate side (4) of the filter housing (1), a cross-flow along the filter material (2) occurs,~~
~~wherein the cross-flow on the retentate side (3) has the same flow direction as the cross-flow on~~
~~the permeate side (4).~~

8. (Currently Amended) The An-apparatus according to claim 7, wherein, in opened
condition of the said shut-off valve (7), the circulation in both said circulation circuits (8, 14) is
such that the pressure drop is substantially equal over the whole surface of the filter material (2).

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9. (New) The apparatus according to claim 1, further comprising:
more than one permeate circulation circuit for forming a corresponding number of back pulse pressure areas on the permeate side of the filter housing.
10. (New) The apparatus according to claim 1, further comprising:
a retentate discharge pipe that is connected to the retentate circulation circuit.
11. (New) The apparatus according to claim 1, wherein the controller and the shut-off valve are configured to operate the shut-off valve at a frequency in the range of 1 to 1000 Hz.
12. (New) The apparatus according to claim 1, wherein the controller is configured to operate the shut-off valve so that in a period comprising the opened and the closed position, the shut-off valve is in an opened position for 50-98% of that period and is in the closed position for 2-50% of that period.
13. (New) The apparatus according to claim 1, the shut-off valve comprising:
a valve housing;
a rotating camshaft that is arranged in the valve housing and having a cam, wherein the cam of the camshaft forms a closure in a certain range of rotational positions and allows a free passage of permeate in other positions, and further wherein the camshaft is continuously drivable.
14. (New) The apparatus according to claim 13, wherein the controller is configured to control the rotational speed of the camshaft for controlling the back-pulse frequency.
15. (New) A method for filtration comprising:
providing an apparatus according to claim 1; and